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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/800,390

03/12/2004

Paul D. Brabant

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01/24/2006

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EXAMINER

VU, DAVID

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

HA

Office Action Summary

Application No.

10/800,390

Applicant(s)

BRABANT ET AL.

Examiner

DAVID VU

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 and 64-77 is/are pending in the application.
- 4a) Of the above claim(s) 31-36 and 64-77 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27, 29 and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-36 and 64-77 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/23/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-6, 9-13, 15-20, 25-27 and 29 are rejected under 35 U. S. C. 102(b) as being anticipated by Tohru (EP 0 858 101 A2).

Tohru discloses a method for depositing an epitaxial Ge-containing layer {See [Second Embodiment] (col. 7, lines 10-48)}, comprising heating a single crystal Si structure 1 to a first temperature (600-650°C) (col. 7, lines 15-18); cooling the single crystal Si structure 1 to a second temperature (550°C) during a cooling time period (col. 7, lines 23-25); contacting the single crystal Si structure 1 with a surface active compound (silane/disilane or german/digermane and silicon) (col. 7, lines 29-33 and col. 1, lines 13-19) during at least a portion of the cooling time period (col. 7, lines 26-29); and depositing an epitaxial layer 4 over the single crystal Si structure 1 at the second temperature {figs. 3(a)-3(f)}.

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2. Claims 1-6, 9-13, 15-20, 25-27 and 29 are rejected under 35 U. S. C. 102(e) as being anticipated by Chu et al. (US Pat. 6,875,279, herein after Chu).

Chu discloses a method for depositing an epitaxial Ge-containing layer {See EXAMPLE 1 (col. 7, line 45 through col. 8, line 11)}, comprising heating a single crystal Si structure 85 to a first temperature (700-950°C) (col. 7, lines 55-58); cooling the single crystal Si structure 85 to a second temperature during a cooling time period (col. 7, lines 66-67); contacting the single crystal Si structure 85 with a surface active compound (silane, Si, Ge) during at least a portion of the cooling time period (col. 8, lines 1-5; col. 3, lines 59-63 & col. 6, line 63 through col. 7, line 1); and depositing an epitaxial layer 86 over the single crystal Si structure 85 at the second temperature (fig. 3).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 7, 8, 14, 21-24 and 30 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Tohru (EP 0 858 101 A2).

Tohru fails to disclose the composition of Ge in the SiGe layer, the second temperature, cooling pressure, flow rate and thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Tohru, by selecting a suitable process parameter for forming an epitaxial Ge-containing layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

4. Claims 7, 8, 14, 21-24 and 30 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Chu (US Pat. 6,875,279).

Chu fails to disclose the composition of Ge in the SiGe layer, the second temperature, cooling pressure, flow rate and thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Chu, by selecting a suitable process parameter for forming an epitaxial Ge-containing layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Response to Arguments

5. Applicant's arguments filed 11/23/05 have been fully considered but they are not persuasive.

Applicant argues that the prior art (Tohru and Chu) does not teach “contacting the single crystal Si structure with a surface active compound during at least a portion of the cooling time period”. This argument is not convincing. Tohru teaches cooling the single crystal Si structure 1 from 650°C to 600°C or less, for example 550°C (col. 7, lines 23-25); then forming the SiGe epitaxial layer 4 at a temperature 600°C or less (col. 7, lines 26-29) by contacting the single crystal Si structure with a surface active compound Si/Ge (col. 7, lines 29-33). Chu teaches forming the silicon layer 85 at a temperatures between 700-950°C (col. 7, lines 55-58); cooling the temperature to 650°C (col. 6, line 63 through col. 7, line 1 or col. 7, lines 66-67); initiate silane flow then forming a low temperature epitaxial SiGe layer 86 at this cooling temperature (col. 8, lines 1-5) by contacting the single crystal Si structure with a surface active compound Si/Ge (col. 3, lines 59-63; col. 6, line 63 through col. 7, line 1 & col. 8, lines 4-5). Therefore, Tohru and Chu, as indicated in the above rejection, clearly discloses claimed features.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DAVID VU
PRIMARY EXAMINER